Environmental occurrence of fluoxetine and its effects on freshwater mussel reproduction,

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Pharmaceuticals are designed with the intent of acting on a biochemical pathway in living organisms. Therefore, it is not surprising that heightened concern was raised when published reports documented the presence of pharmacologically active compounds in surface waters. Though most pharmaceuticals are not likely to accumulate to high concentrations in tissues, they are continually released at low levels and may be exerting effects on non-target aquatic organisms. Of particular concern are the anti-depressant drugs that exert their effects by manipulating levels of the neurotransmitter serotonin, an important modulator of reproduction in fish and bivalves. Previous studies have demonstrated that serotonin and anti-depressant drugs can be used to manipulate spawning in bivalves. The goals of this study were 1) to determine the reproductive effects of fluoxetine, a commonly prescribed antidepressant, on native mussels and 2) to couple laboratory results with measured environmental concentrations of fluoxetine in a municipal wastewater effluent. We exposed gravid female *Elliptio complanata* to a range of fluoxetine concentrations including low, environmentally-relevant levels. Endpoints were time to release of glochidia and viability of released glochidia. Additionally, effects of fluoxetine on mantle lure display behavior of gravid *Lampsilis cardium* and *L. fasciola* were determined. Display behaviors were categorized and recorded at intervals over 7 d. Finally, concentrations of fluoxetine and other anti-depressant drugs were measured by LC-MS-MS in water, passive sampling devices, sediment, and mussel tissue associated with a municipal wastewater effluent. A summary of the reproductive effects of fluoxetine on freshwater mussels and measured environmental concentrations will be presented.

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